



**COUNTRY
COMPARATIVE
GUIDES 2023**

The Legal 500 Country Comparative Guides

Germany

RENEWABLE ENERGY

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This country-specific Q&A provides an overview of renewable energy laws and regulations applicable in Germany.

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GERMANY

RENEWABLE ENERGY



1. Does your jurisdiction have an established renewable energy industry? What are the main types and sizes of current and planned renewable energy projects? What are the current production levels?

Historically, Germany has been at the forefront of the green energy transition. As early as 1991 the feed-in of renewable energy was regulated by law (Electricity Feed-In Act 1990), setting the stage for the growth of a German renewable industry. With the Renewable Energy Sources Act 2000 the federal legislator declared the deployment and development of renewable energy infrastructure a governmental goal. Thanks to guaranteed feed-in tariffs and grid connection privilege, the renewable sector in Germany experienced a boom in the years that followed. The pace of this expansion slowed somewhat between 2014 and 2020, as the fixed feed-in tariffs were first reduced and then replaced by a tendering mechanism for larger plants. Since the change of government in 2020 (with the Green Party now a junior coalition partner) and additionally driven by the energy crisis in 2022, the political will to push renewable energies has increased again.

According to figures from the German Federal Environment Agency, 20.4% of Germany's final energy consumption will be covered by renewable energies in 2022. Overall, the share of renewable energies has developed positively in recent years. However, there are significant differences between the individual sectors: while the share of renewable energies in gross electricity consumption has almost doubled in the last 10 years and was 46.2% in 2022, shares in heating (17.4%) and mobility (6.8%) grew comparatively slowly.

The federal government set itself the goal to expand these capacities to – at least – 80% by 2030. At the same time as electricity consumption is increasing due to the ongoing electrification of industry, the German government expects 600 TWh of renewable electricity demand in 2030. To achieve this goal, it plans to expand Germany's wind onshore capacities to 115 GW by 2030

and solar capacities to 215 GW by 2030. By 2040, it is projected that the installed capacity for wind onshore will reach 160 GW while solar power capacity is expected to reach 400 GW. For wind offshore energy, the German government has set itself the target of increasing installed capacity to at least 30 GW by 2030, a total of at least 40 GW installed capacity by 2035 and a total of at least 70 GW installed capacity by 2045.

All the while the heating and cooling sector still lags behind. Although heating and cooling from renewables increased more significantly in 2022 than in previous years, the share of renewables in this sector is only 17.4%. Solid biomass – i.e. wood in its various forms – provides by far the largest share of renewable heat. In addition to biomass, renewable heat is produced in solar thermal and geothermal plants. The share of solar thermal energy grew from 2 to 5% of total renewable heat between 2000 and 2022. Heat supply from ambient heat and geothermal energy again gained significantly in importance in 2022 and is now at 11%. This shows the strong growth in the heat pump market. The government is currently debating the Draft Building Energy Act 2023, which could ban fossil-fuel heating from 1 January 2045; there are also plans to require new heating systems to run on at least 65% renewables.

2. What are your country's net zero/carbon reduction targets? Are they law or an aspiration?

The Federal Climate Protection Act 2021 requires the government to limit Germany's climate impact to a level compatible with the 1.5°C goal set by the Paris Climate Accord. In order to achieve these goals, the law provides for a reduction of greenhouse gas emissions (compared to the base year 1990) by 65% in 2030 and by 88% in 2040. Ultimately, net-zero the balance between anthropogenic emissions of greenhouse gases from sources and removals of such gases by sinks) is to be achieved by the year 2045.

The Federal Constitutional Court's landmark "climate

protection decision" (BVerfG, First Senate ruling of 24 March 2021 – 1 BvR 2656/18) is also noteworthy in this regard. In it, the court linked climate protection to the right of life and physical integrity – Article 2(2), sentence 1 German Basic Law – and obliged the government to take action to guarantee the "intertemporal protection of freedom".

3. Is there a legal definition of 'renewable energy' in your jurisdiction?

For electricity production, the Renewable Energy Sources Act 2023 (EEG 2023) contains a definition of renewable energies. According to section 3, no. 21 EEG 2023 renewable energies are defined as (i) hydropower including wave, tidal, salt gradient and current energy, (ii) wind energy, (iii) solar radiation energy, (iv) geothermal energy and (v) energy from biomass including biogas, bio-methane, landfill gas and sewage gas, and from the biodegradable fraction of household and industrial waste.

For the building heating and cooling sector, the current version of the Building Energy Act (GEG) also provides a definition for renewable energies. According to section 3(2) GEG, renewables are (i) geothermal energy, (ii) ambient heat, (iii) heat from solar thermal energy, (iv) heat from wind power, (v) heat generated from solid, liquid or gaseous biomass, (vi) cooling from these renewable energies.

4. Who are the key political and regulatory influencers for renewables industry in your jurisdiction and who are the key private sector players that are driving the green renewable energy transition in your jurisdiction?

Regulatory policies regarding the renewable industry and the deployment of renewable energy infrastructure are mainly driven by the Federal Ministry for Economic Affairs and Climate Action ("BMWK"). Since the change of government in 2020, the BMWK has been headed by a "green" minister and is driving forward the energy transition. Administrative control at federal level is mainly in the hands of the Federal Network Agency ("BNetzA").

However, regulation and policy making in Germany is characterized by the federal system, with federal and state authorities cooperating on many aspects and both playing a vital role in the renewable industries sector. At state level, there are also legislative powers that are used for the expansion of renewables. In some federal

states, for example, obligations to install PV systems on roofs are in effect. Regions and municipalities, which have planning authority for the development of wind onshore and solar parks within the framework of the federal acts, should also not be underestimated. In recent years, this level in particular has presented a major roadblock to the expansion of wind onshore energy, as regions and municipalities have been able to control (and in some cases prevent) the expansion of wind energy through their planning. The BMWK is now addressing this challenge stipulating that at least 2% of the nationwide land area must be available for wind energy by 2032 and also providing quotas for each federal state.

Besides the public sector, private NGOs are pushing for a green transition. These include both international players, such as WWF and Greenpeace as well as national organisations, such as NABU, BUND and the Deutsche Umwelthilfe. There are also private think tanks (such as Agora Energiewende) and research institutions such as the Fraunhofer Institute and the Helmholtz Association. In the private sector, numerous players are increasingly positioning themselves for the energy transition; on the one hand, this applies to the entire energy sector and here especially to the large energy suppliers E.ON and RWE; however, there are also many suppliers who have already relied on renewables at an early stage (Naturstrom, Lichtblick, etc.). The wind turbines erected in Germany are predominantly Vestas, Enercon, Siemens and Nordex turbines.

5. What are the approaches businesses are taking to access renewable energy? Are some solutions easier to implement than others?

German businesses are adopting several approaches to access renewable energy. Here are some of the most notable strategies:

- **Direct investments:** Some companies are investing directly in renewable energy projects and building their own renewable energy infrastructure (sometimes even onsite) in order to cover their energy needs. This applies above all to PV rooftop systems and CHP plants. In the emerging hydrogen industry, there is also a trend towards companies building electrolyzers on-site and producing the (green) hydrogen themselves or to buy it directly through offtake agreements.
- **Power Purchase Agreements (PPAs):** PPAs represent a specific kind of contract (usually

long term) where a company agrees to purchase electricity directly from a renewable energy generator. PPAs have only recently started to emerge in Germany, as they are a typical form of marketing electricity from post-EEG plants (i.e. plants after EEG subsidies run out). In addition, current legislation provides further incentives for the conclusion of corporate PPAs, since, for example, PPA marketing must be proven in wind offshore tenders (20% of capacity for 5 years) and the reduction of energy levies is also linked to the purchase of unsubsidised renewable electricity.

- Guarantees of origin (GO): A guarantee of origin is a digital certificate that proves the generation of one MWh of electricity from renewable energy sources. Guarantees of Origin can be traded independently of the electricity generated whereby the green power property may only be utilized once in total. They are kept in a register at the Federal Environment Agency. These digital certificates allow companies to furnish proof their energy was generated from renewables and thus claim CO₂ neutrality.

The specific approach varies depending on circumstances. While direct investment might be a feasible approach for larger companies, smaller ones might prefer PPAs or GOs as they do not require the installation of renewable energy infrastructure and are therefore more flexible.

6. Has the business approach noticeably changed in the last year in its engagement with renewable energy? If it has why is this (e.g. because of ESG, Paris Agreement, price spikes, political or regulatory change)?

In Germany the business approach towards renewable energy has evolved significantly. Many companies are well aware of the public debate on climate change and as a result, as investors and consumers push for more environmental sustainability, many companies have adopted ESG standards and publish reports on their ESG goals. Currently, around half of the DAX 40 companies have enshrined commitments in their annual reports to become climate neutral by 2045 at the latest. Another 17 companies plan to achieve this goal by 2050, while four companies did not give a specific date.

Price spikes following the Russian invasion of Ukraine have also increased urgency for many companies to

transition to a more renewable energy supply. Energy intensive industries in particular are taking measures to reduce their dependency on fossil energy sources.

7. How visible and mature are discussions in business around reducing carbon emissions; and how much support is being given from a political and regulatory perspective to this area (including energy efficiency)?

The green transition is almost omnipresent in German public debate. This public pressure alongside the increasing prevalence of renewables has led many German companies to adopt their own corporate sustainability standards. Currently, around half of the DAX 40 companies have included commitments in their annual reports to become climate neutral by 2045 at the latest. Another 17 companies plan to reach this goal by 2050, while four companies did not give a specific date.

The German government has created multiple incentives for reducing carbon emissions, such as low-interest loans granted by the KfW (German Development Bank) for investments in energy-efficient technologies. That said, there still is a need for action with many businesses lagging behind government-set goals and some are being accused of “greenwashing”. Currently, the draft of the Energy Efficiency Act is being debated in the parliamentary process; the law is intended to lead to significant energy savings by 2030. Companies with high energy consumption are to introduce energy or environmental management systems and draw up specific plans for the implementation of economic energy efficiency measures, the content of which and the planned implementation measures would have to be published. In addition, there are more far-reaching regulations intended to apply to data centres.

8. How are rights to explore/set up or transfer renewable energy projects, such as solar or wind farms, granted? How do these differ based on the source of energy, i.e. solar, wind (on and offshore), nuclear, carbon capture, hydrogen, CHP, hydropower, geothermal and biomass?

A building permit or a permit under the Federal Immission Protection Act is usually needed for the construction and operation of renewable plants. Further permits, approvals or exemptions may be required in individual cases, e.g. under water law, nature conservation law or monument protection law. Such

permits are usually plant-related, i.e. they belong to the operator of the plant and automatically transfer to a new operator if the plant is transferred. In individual cases, notifications to the authorities may be required. The permits for construction and operation are not dependent on the tendering procedure for financial support from renewables. This means that a wind onshore or PV system can be erected even without financial support under the Renewable Energy Sources Act. To participate in a tender for financial support, however, a construction and operation permit is required, which must be registered with the tender authority prior to the tender.

This is different for wind onshore; here, the tender procedure is project-specific, so that permission to develop the specific project is subject to winning the tender.

Germany shut down its last nuclear reactors on 15 April 2023. There shall be no new permits for nuclear plants for the foreseeable future.

Carbon capture technology is still seen critically by the government and parts of society. The Carbon Capturing Act 2009 (KSpG) so far only allows permits for demonstration projects for CO₂ storage. However, as the deadline set by the KSpG for submitting applications for approval expired on 31 December 2016 approval of new CO₂ storage facilities in Germany is currently not possible.

9. Is the government directly involved with the renewables industry? Is there a government-owned renewables company or are there plans for one?

The German government itself is not currently systematically involved in the renewable energy sector nor does it plan to become involved. However, Germany holds shares in individual companies (for different reasons) that play a role in the energy transition. In 2022, the German government took over a majority stake in Uniper SE, which wants to play a significant role in the field of hydrogen and biogases. Through KfW, Germany has a stake in the transmission grid operator 50Hertz; furthermore, the federal state of Baden-Württemberg holds shares in one of Germany's largest energy suppliers (EnBW) and many municipalities have their own – publicly held – energy companies. Furthermore, the acquisition of a 24.9% stake in transmission systems operator TransnetBW by a consortium led by the association of numerous public banks (*Sparkassen*) is underway.

10. What are the government's plans and strategies in terms of the renewables industry? Please also provide a brief overview of key legislation and regulation in the renewable energy sector, including any anticipated legislative proposals?

The government plans to regain and retain Germany's role as an historic leader in the development of renewable energy industries. Since the change of government in 2020, the BMWK has launched several legislative initiatives to promote the expansion of renewables. This was further boosted by the Russian invasion of Ukraine and the related energy crisis in 2022. In 2022, the "Easter Package", a legislative package for the renewable electricity industry, was announced and adopted. With the Easter Package, the tender volumes for renewables in Germany were significantly increased. This means that more renewable production capacities will be put out to tender in the coming years. The Wind and PV Summit, initiated by the BMWK, took place in spring 2023. The summits produced two guideline papers that are to be implemented in 2023 by means of additional legislative packages. The goal is to reduce the hurdles in the expansion (and specifically in the approval procedures) of the wind and PV sector.

The main legislative acts are the Renewable Energy Sources Act (EEG, for the financial promotion of renewable electricity), the Energy Industry Act (EnWG, framework act for grid connection, grid expansion and general matters relating to the energy industry), the Offshore Wind Energy Act (WindSeeG, on the expansion of wind onshore energy and its financial promotion), Building Energy Act (GEG, for specifications on energy use in the building sector). The Energy Financing Act (EnFG, standardisation of energy levies in Germany and possibilities to reduce levies for energy-intensive companies) came into force on 1 January 2023. Currently, the Energy Efficiency Act (EnEfG) is being discussed in the German Bundestag, which is intended to establish the obligation for companies to regularly review efficiency measures.

11. Are there any government incentive schemes promoting renewable energy (direct or indirect)? For example, are there any special tax deductions or subsidies offered? Equally, are there any disincentives?

The primary scheme of remuneration for larger plants under the EEG 2023 is "subsidised direct marketing". Under this model, the plant operator markets the

electricity on the market (via a direct marketer) and is subsidised by the so-called market premium from the grid operator in parallel to the price achieved on the market. The scope/design of direct marketing depends on the contractual arrangements made with the direct marketer. The market premium is determined on a monthly basis and paid out by the grid operator to which the renewable plant is connected. This is usually a TSO (Transmission System Operators); the four German TSOs manage the EEG account and thus the income and expenditure within the market. The market premium is calculated from the reference prices (*anzulegender Wert*) less the so-called monthly market value of the respective energy source. The monthly market value is the actual monthly average of the market value for electricity from onshore wind turbines on the spot market of the electricity exchange (available at: <https://www.netztransparenz.de/EEG/Marktpremie/Marktwerte>). If the energy exchange prices rise or fall, the amount of the market premium is automatically adjusted – if the monthly market value is higher than the reference prices, the market premium drops to zero. Unlike CfDs, the market premium does not become negative.

Smaller plants will still be provided with a fixed feed-in tariff. The EEG 2023 provided for an adjustment of the fixed feed-in tariffs (and increase for e.g. PV systems). In addition, there is an additional feed-in fee if the entire electricity produced in smaller plants is fed into the public grid.

The KfW (German Development Bank) also offers many low-interest loans for renewable energy projects and energy efficiency measures.

12. Has your Government had to help with the basic cost of energy over the last year and has that led to any discussion about de-linking the gas price and renewables prices?

The Russian invasion of Ukraine and the subsequent price spikes on the energy market forced the government to implement several economic relief packages. The most important ones were the energy price caps for gas, heat and electricity. The gas price cap (Natural Gas and Heat Price Brake Act) set the price of natural gas for private consumers and small companies to 12ct/kWh for 80% of their 2021's consumption and for industrial consumers to 7ct/kWh for 70% of their 2021's consumption. The electricity price cap (Electricity Price Brake Act) capped the price for private consumers and small companies to 40ct/kWh for 80% of their 2021's consumption and for larger

enterprises to 13ct/kWh for 70% of their 2021's consumption.

Furthermore, the Federal Ministry for Economic Development and Climate Action proposed to introduce an industry electricity price cap of 7ct/kWh for the future years; however, this initiative is still being debated.

13. If there was one emerging example of how businesses are engaging in renewable energy, what would that be? For example, purchasing green power from a supplier, direct corporate PPAs or use of assets like roofs to generate solar or wind?

An (upcoming) trend in Germany will be PPAs, and it is expected that companies will increasingly purchase renewable electricity through (corporate) PPAs. This trend is supported by various factors: (i) in the next few years, many EEG plants will be running out of subsidies and corporate PPAs are a possible follow-up marketing for these plants; (ii) since 2023, there are additional legal incentives to purchase unsubsidised renewable electricity. For the offshore tender mechanism, 20% of the capacity must be sold via PPAs for 5 years; in addition, energy levy reductions are linked to the purchase of unsubsidised renewable electricity. (iii) In order to support their own ESG and sustainability strategies, companies are increasingly looking to purchase green electricity and ensure this in the long term through PPAs. (iv) Due to the rapid increase in energy prices in 2022, companies are also willing to enter into long-term commitments for stable prices, which can be offered especially through renewables.

14. What are the significant barriers that impede both the renewables industry and businesses' access to renewable energy? For example, permitting, grid delays, credit worthiness of counterparties, restrictions on foreign investment.

The main hurdle for the expansion of wind energy is the approval procedure. The average duration of the procedure (without the preparation of the documents) is about 2.5 years. With the preparation of the approval procedure and negotiations with landlords, banks, developers and insurance companies, it can take an average of 5-7 years from the project conception to commissioning. The government has recognised this problem; with several legislative packages, it aims to reduce the formal and material requirements for the approval procedure for wind onshore. Further

simplifications are planned for the repowering of plants, e.g. a reduction of the assessment standard to a delta assessment (compared to the old plant).

In the PV sector, coordination with the grid operator has emerged as a major obstacle. Particularly in the case of on-site supply, there are difficulties in coordinating measurement and calibration concepts in order to differentiate between the quantities of electricity supplied by the PV system and from the grid. In 2023, however, there might be standardisation in this area; the BMWK has announced a position paper from the responsible Federal Network Agency (Bundesnetzagentur – BNetzA).

A general problem for the further ramp-up of renewables will be the shortage of qualified personnel. Experience already shows that the installation of wind, PV and (in the heating sector) heat pumps can take several months to be realized, due to the lack of qualified personnel. If the number of new installations is to double or even triple in the next few years, this problem will intensify.

Foreign investments for greenfield developments have only been regulated since 2023; the BNetzA can exclude a non-EU bidder from the tender mechanism if the operation of the planned plant is likely to impair public order or the security of the Federal Republic of Germany.

15. What are the key contracts you typically expect to see in a new-build renewable energy project?

A necessity for new-build renewable energy projects are the following key contracts: (i) land leases or acquisition agreements to secure the lots of land where the project will be located; (ii) construction or EPC contracts (Engineering, Procurement and Construction); (iii) grid connection agreements with the local grid operator to establish the terms for connection to the grid and feed-in of the produced electricity; (iv) direct marketing agreement in order to profit from the EEG market premium or (corporate) PPA to sell the produced electricity directly.

Other typical key contracts include (i) operation and maintenance (O&M) agreements to ensure the operation and maintenance of the project (if outsourced); (ii) finance agreements; (iii) additional service agreements (e.g. regarding fulfilment of reporting, notification obligations, etc.) (iv) as well as various insurance policies.

16. Are there any restrictions on the export of renewable energy, local content obligations or domestic supply obligations?

There are no restrictions to that effect.

17. Has deployment of renewables been impacted in the last year by any non-country specific factors: For example, financing costs, supply chain or Covid 19?

While Covid 19 did not pose a major hurdle to the deployment of renewables (the pandemic did in fact increase the percentage of renewables as demand plummeted) other external factors such as the Russian invasion of Ukraine and the subsequent energy crisis have certainly impacted the industry.

18. Could you provide a brief overview of the major projects that are currently happening in your jurisdiction?

Currently Germany works on a massive expansion of its renewable energy infrastructure. Some major projects are several offshore-wind-farms in the North Sea such as “Borkum Riffgrund” (913 MW capacity, under construction), “He dreht” (960 MW capacity, under construction), “Nordlicht I” (980 MW capacity, in planning) and in the Baltic Sea such as “Gennacker” (927 MW capacity, in planning). Major solar farms such as “Witznitz II” (650 MW Capacity, under construction) in the state of Saxony will also diversify Germany’s energy supply.

In order to ensure that the electricity supply remains secure and that electricity can be transported from the wind and PV regions in the north to the industrial centres in the west and south, several thousand kilometres of power lines must be converted and expanded in Germany. The total length of all 119 onshore grid expansion projects is currently 13,679 km. The majority of these lines, divided into different routes, are currently in the process of being approved.

19. How confident are you that your jurisdiction can become a leader in newer areas like offshore wind or hydrogen?

The renewable industries are of strategic importance to the federal government. Germany is prepared to invest billions of euros annually in the hydrogen and offshore-wind sectors. Combined with the ingenuity of German engineering and Germany’s strong tradition in the field

of renewables in general, this makes Germany uniquely positioned to become a leader in newer fields of the renewable energy market.

For wind offshore, the German government has set the target of increasing installed capacity to at least 30 GW by 2030, a total of at least 40 GW installed capacity by 2035 and a total of at least 70 GW installed capacity by 2045. The German government adopted the National Hydrogen Strategy in June 2020. The goal is to reduce CO2 emissions in industry, mobility and energy using hydrogen technology. In addition to direct subsidies for hydrogen projects, the production of green hydrogen will be exempt from energy levies.

20. How are renewables projects commonly financed in your jurisdiction?

In Germany, renewables were initially financed through

fixed feed-in tariffs. Due to the high financial burden of the fixed feed-in tariffs, more market-oriented models were introduced from 2012 and the fixed feed-in tariffs were reduced. Since 2017, a mandatory tender mechanism has also been in place for larger plants. The costs of the fixed feed-in tariffs and the financial support under the tender mechanism were financed for 20 years by a Renewable Energy Sources Levy ("EEG Levy"). This EEG Levy was paid by end customers, with reliefs for energy intensive companies. On 1 July 2022, the EEG levy was reduced to 0ct/KWh. The costs of the current fixed feed-in tariff (for old and smaller plants) and the tender mechanism are now paid from the national Climate and Transformation Fund. The Climate and Transformation Fund is endowed with national budget resources and collects the revenues from the CO2 charge. Due to the increase in energy prices, the TSOs responsible for the EEG Levy expect that no payments from the Climate and Transformation Fund will be required in 2023.

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